SECTION 2

RESOURCE INFORMATION AND AGENCY PROGRAM UPDATES

The tables in this section summarize budgetary information of the Federal government for Fiscal Years 2006 and 2007. The funds shown are those used to provide meteorological services and associated supporting research that has as its immediate objective the improvement of these services. Fiscal data are current as of the end of August 2006 and are subject to later changes. The data for FY 2007 do not have legislative approval and do not constitute a commitment by the United States Government. The budget data are prepared in compliance with Section 304 of Public Law 87-843, in which Congress directed that an annual horizontal budget be prepared for meteorological programs conducted by the Federal agencies.

AGENCY OBLIGATIONS FOR METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH

Table 2.1 contains fiscal information, by agency, for meteorological operations and supporting research. The table shows the funding level for Fiscal Year (FY) 2006 based on Congressional appropriations, the budget request for FY 2007, the percent change, and the individual agencies' percent of the total Federal funding for FY 2006 and FY 2007.

DEPARTMENT OF AGRICULTURE (USDA)

The USDA budget request for FY 2007 is $51.1 million for operations and supporting research, representing a 14.7 percent decrease from FY 2006. A large portion of this decline was due to a reduction in funding for supporting research. USDA has requested a total $31.4 million for research and development programs, an $8.3 million decrease from 2006. The FY 2007 amount requested for meteorological operations is $19.7 million, down from $20.2 million in FY 2006.

Operational activities include specialized weather observing networks such as the SNOTEL (SNOw pack TELemetry) system operated by the Natural Resources Conservation Service (NRCS) and the remote automated weather stations (RAWS) network managed by the Forest Service. The SNOTEL and RAWS networks provide cooperative data for NOAA's river forecast activities, irrigation water supply estimates, and Bureau of Land Management operations. The Forest Service is also the world leader in developing emissions factors from fires and modeling its dispersion. The USDA and the Department of Commerce (DOC) jointly operate a global agricultural weather and information center located in Washington, D.C. This Joint Agricultural Weather Facility operationally monitors global weather conditions and assesses the impacts of growing season weather on crop and livestock production prospects. This information keeps crop and livestock producers, farm organizations, agribusinesses, state and national farm policy-makers, government agencies, and foreign buyers of agricultural products apprised of worldwide weather-related developments and their effects on crops and livestock. Furthermore, tracking weather and crop developments in countries that are either major exporters or importers of agricultural commodities keeps the agricultural sector informed on potential competitors. USDA is also actively involved in drought monitoring efforts in concert with the National Drought Mitigation Center.

For supporting research, USDA funds research projects through the Cooperative State Research, Education and Extension Service (CSREES) that study the impact of climate and weather on food and fiber production. The goal of supporting research is to develop and disseminate information and techniques to ensure an abundance of high-quality agricultural commodities and products while minimizing the adverse effects of agriculture on the environment. Furthermore, the Agricultural Research Service (ARS) conducts research on how annual variation in weather adversely effects crop and animal production, hydrologic processes, the availability of water from watersheds, and the environmental and economic sustainability of agricultural enterprises.

DEPARTMENT OF COMMERCE (DOC)

All reported DOC meteorological activities are within the National Oceanic and Atmospheric Administration (NOAA). The NOAA FY 2007 total congressional request of $2.04 billion for meteorological programs represents an increase of 4.2 percent over the FY 2006 appropriated funds. NOAA's FY 2007 operations and supporting research requests for major line office activities are described below:

WEATHER SERVICES

The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the U.S., its territories, adjacent waters, and ocean areas for the protection of life and property and the enhancement of the national economy.

TABLE 2.1 METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH COSTS*, BY AGENCY

(Thousands of Dollars)

	Operations			% of FY2007	Supporting Research			% of FY2007	Total			% of FY2006	% of FY2007
AGENCY	FY2006	FY2007	%CHG	TOTAL	FY2006	FY2007	%CHG	TOTAL	FY2006	FY2007	%CHG	TOTAL	TOTAL
Agriculture	20201	19710	-2.4	0.7	39706	31395	-20.9	7.6	59907	51105	-14.7	1.8	1.5
Commerce/NOAA(Subtot)	1838032	1954209	6.3	64.5	122824	89787	-26.9	21.7	1960856	2043996	4.2	59.1	59.3
NWS	848244	881866	4.0	29.1	21057	22130	5.1	5.3	869301	903996	4.0	26.2	26.2
NESDIS	952220	1033883	8.6	34.1	31753	24771	-22.0	6.0	983973	1058654	7.6	29.7	30.7
OAR	0	0	0	0.0	68358	41230	-39.7	10.0	68358	41230	-39.7	2.1	1.2
NOS	24078	24970	3.7	0.8	500	500	0.0	0.1	24578	25470	3.6	0.7	0.7
NMAO	13490	13490	0.0	0.4	1156	1156	0.0	0.3	14646	14646	0.0	0.4	0.4
Defense(Subtot)	503983	514056	2.0	17.0	87220	89369	2.5	21.6	591203	603425	2.1	17.8	17.5
Air Force	309401	317089	2.5	10.5	28675	34899	21.7	8.4	338076	351988	4.1	10.2	10.2
DMSP**	84121	103885	23.5	3.4	3852	969	-74.8	0.2	87973	104854	19.2	2.7	3.0
Navy	59288	47786	-19.4	1.6	41427	42581	2.8	10.3	100715	90367	-10.3	3.0	2.6
Army	51173	45296	-11.5	1.5	13266	10920	-17.7	2.6	64439	56216	-12.8	1.9	1.6
Homeland Security (Subtot)	19340	20110	4.0	0.7	0	0	0.0	0.0	19340	20110	4.0	0.6	0.6
USCG	19340	20110	4.0	0.7	0	0	0.0	0.0	19340	20110	4.0	0.6	0.6
Interior/BLM	2400	2400	0.0	0.1	0	0	0.0	0.0	2400	2400	0.0	0.1	0.1
Transportation(Subtot)	483316	518624	7.3	17.1	25706	27800	8.1	6.7	509022	546424	7.3	15.3	15.9
FAA	483027	518335	7.3	17.1	21506	23600	9.7	5.7	504533	541935	7.4	15.2	15.7
FRA	289	289	0.0	0.0	0	0	0.0	0.0	289	289	0.0	0.0	0.0
FHWA	0	0	0.0	0.0	4200	4200	0.0	1.0	4200	4200	0.0	0.1	0.1
EPA	0	0	0.0	0.0	9000	9000	0.0	2.2	9000	9000	0.0	0.3	0.3
NASA	2394	2463	2.9	0.1	162800	166400	2.2	40.2	165194	168863	2.2	5.0	4.9
NRC	120	120	0.0	0.0	0	0	0.0	0.0	120	120	0.0	0.0	0.0
TOTAL	2869786	3031692	5.6	100.0	447256	413751	-7.5	100.0	3317042	3445443	3.9	100.0	100.0
% of FY TOTAL	86.5%	88.0%			13.5%	12.0%			100.0%	100.0%			

*The FY 2006 funding reflects Congressionally appropriated funds; the FY 2007 funding reflects the amount requested in the President's FY 2007 budget submission to Congress.

**DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

NWS data and products form a national information database and infrastructure which can be used by other government agencies, the private sector, the public, and the global community.

The U.S. is one of the most severe-weather prone countries on Earth. Each year, Americans cope with an average of 10,000 thunderstorms, 5,000 floods, 1,200 tornadoes, as well as 6 deadly hurricanes. Some 90 percent of all Presidentially-declared disasters are weather related, causing approximately 500 deaths per year and $14 billion in damage. According to the American Meteorological Society, weather is directly linked to public safety and about one-third of the U.S. economy (about $3 trillion) is weather sensitive.

More and more sectors of the U.S. economy recognize the impacts of weather, water, and climate on their businesses, and are becoming more sophisticated at using weather, water, and climate information to make better decisions. To meet this growing demand for information and to improve the timeliness and accuracy of warnings for all weather related hazards, the NWS will continue to enhance observing capabilities, improve data assimilation to effectively use all the relevant data NWS and others collect, improve collaboration with the research community, make NWS information available quickly, efficiently, and in a useful form (e.g., the National Digital Forecast Database) and include information on forecast uncertainty to help customers make fully informed decisions.

With about 4,800 employees in 122 weather forecast offices (WFO), 13 river forecast centers, 9 national centers and other support offices around country, NWS provides a national infrastructure to gather and process data worldwide from the land, sea, and air. This infrastructure enables data collection using technologies such as Doppler weather radars, satellites operated by NOAA's National Environmental Satellite, Data, and Information Service (NESDIS), data buoys for marine observations, surface observing systems, and instruments for monitoring space weather and air quality. These data feed sophisticated environmental prediction models running on high-speed supercomputers. Our highly trained and skilled workforce uses powerful workstations to analyze all of these data to issue climate, public, aviation, marine, fire weather, air quality, space weather, river and flood forecasts and warnings around-the-clock. A high-speed communications hub allows for the efficient exchange of these data and products between NWS components, partners and customers. NWS forecasts and warnings are rapidly distributed via a diverse dissemination infrastructure including NOAA Weather Radio. Finally, customer outreach, education, and feedback are critical elements to effective public response and improvements to NWS services.

The FY 2007 President's Budget Request supports the funding and program requirements necessary to address established NOAA strategic goals and sets NWS on a path to achieve its vision: *Produce and deliver forecasts that can be trusted; use cutting-edge technologies; provide services in a cost-effective manner; strive to eliminate weather related fatalities; and improve the economic value of weather, water, and climate information.*

NOAA requests a total of $903,996,000 million and 4,606 FTE to support the continued and enhanced operations of the National Weather Service. The total includes $24,754,000 for Adjustments to Base, $37,445,000 million for Program Increases, and $25,597,000 in Terminations.

ADJUSTMENTS TO BASE:

NOAA requests a net increase of $24,754,000 and 0 FTE to fund adjustments to base across all accounts in the National Weather Service activities. With this increase, program totals will fund the estimated FY 2007 Federal pay raise of 2.2 percent and annualize the FY 2006 pay raise of 3.1 percent. Program totals will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration.

NWS also requests the following transfers between line offices or appropriations for a net change to NOAA of zero:

- $2,291,000 is transferred from the National Tsunami Hazard Mitigation Program to the Strengthen the U.S. Tsunami Warning Network Program Planning Activity (PPA) within the Local Warnings and Forecasts Line Item. This transfer has no net effect on overall NWS or NOAA funding and was done simply to consolidate all NWS Tsunami funding into one PPA.
- $3,000,000 is transferred from the Local Warning and Forecasts line to benefit the Oceanic and Atmospheric Research (OAR) Competitive Research Program.
- $21,500,000 is transferred from the National Data Buoy Center to the Local Warnings and Forecasts base and Alaska Data Buoy PPAs within the Local Warnings and Forecasts line item.
- $5,800,000 is transferred from the National Hurricane Center to the Central Forecasts Guidance PPA within the Central Forecasts Guidance line item.

NWS - ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2007:

NOAA requests a net increase of $37,445,000 and 9 FTE over the FY 2007 base for a total request of $783,446,000 and 4,606 FTE. These changes are summarized at the subac-

tivity level below and to be concise, do not include descriptions below $1,000,000. Descriptions of each request by line item are located in the NOAA FY 2007 Technical Budget.

Operations and Research
($687,856,000)

A net increase of $28,654,000 and 9 FTE above the base is requested in the Operations and Research subactivity, for a total of $687,856,000 and 4,424 FTE.

Local Warnings and Forecasts: $28,654,000 and 9 FTE in net increases above the base, for a total of $636,793,000 and 4,125 FTE, are requested under the Local Warnings and Forecasts line item of the Operations and Research subactivity.

• NOAA requests 0 FTEs and $1,400,000 to operate and maintain the seven new weather data buoys funded/deployed under the FY 2005 Hurricane Supplemental Appropriation. These buoys support enhanced real time hurricane data observations and storm monitoring in the Caribbean, Gulf of Mexico, and the Atlantic Ocean to support the NOAA hurricane warning and forecast mission. The FY 2005 Hurricane Supplemental provided one-time funding to procure and deploy these buoys. This program adjustment requests the funding required to support the long-term operation and maintenance of these platforms. This investment is required for NOAA's implementation of the Integrated Ocean Observing System (IOOS) as the coastal and open ocean component of the Global Earth Observation System of Systems (GEOSS). Combined with other like-identified IOOS investments across NOAA, it is part of NOAA's strategy to provide initial benefits of an integrated ocean observing system, focusing on enhancing key observational capabilities throughout NOAA, and our ability to provide customers with enhanced coastal data and information. The seven newly installed data buoys, consisting of one 3-meter, two 6-meter, two 10-meter, and two 12-meter buoys, require annual maintenance and shore-side operating/infrastructure support to maintain reliable data output. Funds will be used to provide: field service and maintenance; shore-side operation/infrastructure support; and to maintain spare equipment/buoy to support field maintenance strategy.

• NOAA requests $12,360,000 and 4 FTE to strengthen the U.S. tsunami warning program. In response to the 2004 Indian Ocean Tsunami, the Administration proposed expanding the U.S. Tsunami Warning Program to protect U.S. lives and property along all coasts (Pacific, Gulf of Mexico, Atlantic and the Caribbean). In order to continue the Administration's commitment to strengthening the U.S. Tsunami Warning Program and mitigate a similar seismic/tsunami event in the U.S., NOAA needs to build upon the foundation laid in FY 2005 and FY 2006 and continue to accelerate and improve its: (1) Tsunami Hazard Assessment Programs (including comprehensive coastal U.S. risk assessments/inundation mapping, modeling and forecasting efforts); (2) Tsunami Warning Guidance Programs (including 24/7 tsunami detection and warning systems and the dissemination of accurate and timely tsunami forecasts and warnings); and (3) Tsunami Mitigation Programs (including community-based emergency response plans) and public education/awareness (Tsunami Ready communities and inundation/evacuation mapping). Funds will be used to operate and maintain the newly expanded DART systems, new sea-level monitoring stations, the upgraded local seismic networks supporting the West Coast /Alaska Tsunami Warning Center (WC/ATWC) and the Richard H. Hagemeyer Pacific Tsunami Warning Center (PTWC), and to operate both the WC/ATWC and PTWC as 24/7 Operation Centers.

• NOAA requests $3,500,000 and 5 FTE to transfer the Wind Profilers from research to operations. Wind Profilers, vertical looking radars, installed in 1988, are used for a variety of analytical forecasting tasks. Wind profile data are used as input for numerical (computer) weather models that predict clouds, precipitation, and temperature. The data also provide important indicators of where severe weather such as tornadoes and winter storms may form, requiring weather advisories, watches, or warnings. Weather forecasters also use wind profiler data for issuing aviation Significant Meteorological (SIGMET) advisories and wildfire predictions. The NOAA Profiler Network (NPN) must be upgraded to operate at a different frequency because of interference with signals from new search and rescue (SAR) satellites expected to launch by the European Space Agency in FY 2006. Currently, the SAR beacons and the NPN operate at the same frequency. Consequently, the SAR beacon will interfere with NPN wind profiling radars whenever a satellite is overhead. The NPN wind profile information improves NWS operational warning and watch performance capability. Performance statistics indicate that tornado, winter storm, severe storm, flash flood forecasts and warnings, and aviation weather and fire weather warnings for NWS WFOs with wind profilers are more accurate and are able to provide longer warning lead-times. In FY 2007 NWS will: initiate engineering design and development contract for new frequency compliant transmitters; coordinate with data users the development of contingency plans for interference issues that may arise; and, provide operations and maintenance support for the current Profiler network.

• NOAA requests $1,200,000 and 0 FTE to expand the multi-year effort to improve aviation weather services. This requested increase will enable

procurement and fielding of 75 additional water vapor sensors as part of an Integrated Upper Air Observing system, and transition additional products to a digital environment. Today, weather accounts for 70 percent of all air traffic delays within the U.S. National Airspace System (NAS), resulting in a $10B impact to the U.S. economy, $4B of which the Federal Aviation Administration (FAA) has determined is preventable. The Aviation Weather program must continue to implement projects and training opportunities that improve both the accuracy of weather information and the way in which weather information is utilized. Pilots, controllers and flight planners require products in digital formats to facilitate and expand their use in the cockpit and to convey forecast specifics graphically lending to better, more informed decision making. The Aviation Program must be prepared to enable the NWS to transition and sustain FAA Research and Development (R&D) efforts in aviation weather that are valued over $24M/year. In addition, the Aviation Program is supporting the Joint Planning and Development Office (JPDO) effort to develop the Next Generation Air Transportation Systems (NGATS), with the Department of Commerce (DOC) leading a 5-agency [Department of Defense (DOD), Department of Transportation (DOT), Department of Homeland Security (DHS), National Aeronautics and Space Administration (NASA), and DOC] Weather Integrated Process Team.

• NOAA requests $2,500,000 and 0 FTE for the Air Quality Forecasting Program. This program provides air quality forecast guidance with the implementation of NOAA's Air Quality Forecast capability. This increase will be used for nationwide deployment of ozone forecasts in FY 2009, and for initial PM forecast capability in FY 2012. The air quality forecast capability for next-day ground-level ozone, first deployed operationally in September 2004, over the Northeastern U.S., and now covering the Eastern U.S., will be extended through phased development and testing nationwide in FY 2009.

• NOAA requests $3,199,000 and 0 FTE for the Space Environment Center. SEC provides real-time monitoring and forecasting of solar and geophysical events, conducts research in solarterrestrial physics, and develops techniques for forecasting solar and geophysical disturbances. SEC provides services to a broad user community of government agencies, industries, public institutions, and private individuals involved in satellite operation, space exploration, radio navigation, high-altitude polar flights, high-frequency communications, remote intelligence gathering, long-line power and data transmissions, and geophysical exploration.

• NOAA requests $890,000 and 0 FTE for the Cooperative Observer Program. This request funds Operations and Maintenance (O&M) support for NOAA legacy Cooperative Observer program. This program provides observational meteorological data in near real-time to support forecast, warning and other public service programs of the NWS. More than 11,000 volunteers take observations on farms, in urban and suburban areas, national parks, seashores, and mountaintops and the data that are collected are truly representative of where people live, work and play.

• NOAA requests $2,457,000 and 0 FTE for U.S. Weather Research Program. This request will accelerate hurricane research, air quality research for particulate matter forecasts, and to expand The Observing System Research and Predictability Experiment (THORPEX). The hurricane research activities include improving forecasts of hurricane intensity at landfall.

• NOAA requests $1,098,000 and 0 FTE for the Advanced Hydrological Prediction Services (AHPS). This funding allows continued nationwide implementation of AHPS, with deployment at an additional 309 forecast points in these areas. AHPS information comes from the combined use of remote sensing, data automation and advanced computer modeling to analyze river data, and create graphical displays of flood probability forecasts, including flood-forecast maps, pinpointing areas where flooding may occur. The FY 2007 budget also supports extramural partnerships to carry out operationally-oriented hydrologic research, deployment of new flash-flood forecasting tools, and introduction of more effective river forecasting models.

Systems Operation & Maintenance (O&M) $95,590,000

A net increase of $8,791,000 and 0 FTE above the base is requested in the Systems Operation & Maintenance subactivity, for a total of $95,590,000 and 182 FTE.

• NOAA requests an increase of $2,500,000 and 0 FTE, to implement a telecommunications network solution that resolves an existing single-point-of-failure associated with the NWS Telecommunications Gateway Critical Infrastructure Protection (NWSTG-CIP). This investment will ensure uninterrupted delivery of critical meteorological data necessary for the protection of life and property, and the economic well being of the Nation. The NWSTG-CIP is the hub for all NWS/NOAA weather, water and climate data and information, and has been identified as an essential government resource in Presidential Decision Directive - 67 Enduring Constitutional Government and Continuity of Government Operations. The geographically disparate backup system will be connected to the NWSTG primary and user community through a telecommunications network. Funds will be used

for operations and maintenance (O&M) in FY 2007 which includes annual recurring telecommunications costs for switching all NWSTG circuits through a switch located at the Local Exchange Carrier (LEC) central office. The Department of Commerce Chief Information Office (CIO) mandated that the connectivity between the NWSTG and NWSTG-CIP eliminates all single-points-of failure. In order for this to transpire, a network was designed to bypass the LEC central office. Without full network connectivity, the NWSTG will remain a single point of failure, risking the delivery of critical meteorological data necessary for the protection of life and property, vital to the economic well being of the Nation.

• NOAA requests $3,461,000 and 0 FTE for Advanced Weather Interactive Processing System (AWIPS). This request will fund continued operations and maintenance for the network of 169 fielded systems. AWIPS integrates satellite and NEXRAD Doppler weather radar data and provides to the local field forecaster capabilities to significantly improve forecasts and warnings.

• NOAA requests $2,830,000 and 0 FTE for NEXRAD. This request will restore funding necessary for continued operations and maintenance for the network of 123 NEXRAD systems. NEXRAD systems are critical for real-time observations and forecasts of severe weather events, including tornadoes, heavy precipitation, and hurricanes.

SYSTEMS ACQUISITION
($66,611,000)

NOAA requests a decrease of $2,440,000 and 0 FTE for a total of $1,030,000 to reflect the planned reduction in the procurement of program assets that were required to accelerate the development and deployment of a national tsunami warning system in FY 2005 and FY 2006. Funds will be used to procure the four remaining Deep-ocean Assessment and Reporting of Tsunamis (DART) buoy spares.

This budget request is necessary to complete the foundation laid by the Administration in FY 2005 and FY 2006 to strengthen the U.S. tsunami warning program.

• NOAA's Environmental Real Time Observation Network (NERON) (formerly known as Cooperative Observer Network Modernization). NOAA is requesting no change to the $4,234,000 base for NERON, which will provide the U.S. with a network of accurate, real-time surface weather data (temperature and precipitation at a minimum) obtained with state-of-the-art measurement, monitoring, and communication equipment. Quality controlled, higher density, real-time surface data will preserve and enhance the climate record of the Nation and improve temperature forecast skill, river height forecast error, radar estimates of precipitation, drought monitoring resolution, hydrology planning, and energy optimization for NWS customers. A specific goal of NERON is to form the infrastructure for the National Integrated Drought Information System (NIDIS). Additional sensors from proven commercial off-the-shelf technology, including wind data, can provide timely data for response to homeland security events or disasters. The objective of NERON is to deploy, integrate or upgrade up to 8,000 modernized sites. A part of NERON is the Historical Climate Network (HCN), comprised of approximately 1200 stations. Because of its unique purpose as the long-term network developed to assist in the detection of regional climate change, it is a high priority of NWS to ensure 5-6 times the integrity of its long-term database. Like other manual NERON sites, the HCN uses older technology, and the data are not available in real-time. Real-time observations are necessary to meet users' needs and to provide sensor information for prompt maintenance actions. The modernization of HCN sites will mitigate the lack of information from geographical sub-regions and provide, in real-time, very high quality surface observations of temperature and precipitation that meets climate, hydrology, and weather and water forecasting needs. Modernizing the HCN will reduce the uncertainty in the measure of regional climate change.

NOAA Weather Radio

NOAA requests no change to the $5,594,000 base to complete and to sustain NOAA Weather Radio (NWR). Funds will be used to procure all of the transmitters for the seventeen (17) sites identified as high risk of severe weather events and begin installations. Nine (9) transmitters are planned to be installed in FY 2006 and the remaining eight (8) in FY 2007. Additionally, funds will be used to begin the refurbishment of four hundred (400) stations established in the 1970s, eliminating single points of failure and improving network reliability.

Weather and Climate Supercomputing

NOAA requests no change to the $19,092,000 base for Weather and Climate Supercomputing. The cyclical upgrade of the NWS weather and climate supercomputing capability is intended to procure the computing and communications equipment needed to receive and process the increasing wealth of environmental data acquired by modernized observing systems, process improved and more sophisticated numerical weather prediction models, and stay current with the supercomputing technology the market has to offer. Execution of this program promotes public safety and the protection of property by providing the National Center for Environmental Protection (NCEP) with the computer systems that are capable of producing more accurate NWS climate and numerical weather prediction (NWP)

guidance products for hurricanes, severe thunderstorms, floods, and winter storms. Additionally, the supercomputing system more accurately forecasts large-scale weather patterns in the medium (3 to 10 days) and extended range (30 days), plus forecasts of major climate events such as El Niño and La Niña. In addition, the computer upgrades will improve the delivery of products to the field and provide system users with enhanced productivity. These products and services will lead to significant economic benefits for users, like the agriculture, construction, and transportation industries.

Weather and Climate Supercomputing Backup

NOAA requests no change to the $7,077,000 base for the Weather and Climate Supercomputing Backup. Because of the critical need of the weather and climate output, it is essential that a backup capability be operational, as part of contingency planning.

Automated Surface Observing System

NOAA requests a decrease of $700,000 and 0 FTE for a total of $3,935,000 for the Automated Surface Observing System (ASOS). This decrease reflects a planned change in the implementation strategy for 240 of the total 377 sites from 40,000 foot ceilometers to 25,000 foot ceilometers.

Advanced Weather Interactive Processing System

NOAA requests no change to the $12,764,000 base for the Advanced Weather Interactive Processing System (AWIPS)/NOAAPort. AWIPS is the cornerstone of the modernized NWS. This system integrates and displays all hydrometeorological data at NWS field offices. AWIPS acquires and processes data from modernized sensors and local sources, provides computational and display functions at operational sites, provides robust communications system to interconnect NWS operational sites, and disseminates warnings and forecasts in a rapid, highly reliable manner. This system integrates satellite, NEXRAD Doppler weather radar data, and numerical weather prediction data enabling field forecasters to better visualize environmental processes to enable the creation of timely and accurate forecasts and warnings. AWIPS provides the only display for NEXRAD Doppler weather radar data at NWS Weather Forecast Offices (WFOs) and River Forecast Centers (RFCs). The AWIPS NOAAPort satellite broadcast network offers the communications capability to provide internal and external users with open access to much of NOAA's real-time environmental data. These funding resources will be used to further improve AWIPS processing, communications, and software architecture to support system processing demands from increases in NEXRAD Doppler weather radar data, increases in NCEP model data, and new NESDIS polar and geostationary satellite imagery. These pre-planned and ongoing NOAA investments in modeling, satellite instruments, and radar improvements (NEXRAD Product Improvement) represent NOAA's commitment to bring forecasters the data and information required to improve forecast accuracy and warning lead times. NWS Government Performance and Results Act goals are based on the effective use of these technology investments along with advanced decision assistance tools, forecast preparation and advanced database capabilities. Sustained investment in the AWIPS hardware, communications, and software infrastructure is necessary to achieve these performance goals to further improve NWS Tornado Warning Lead Time, Flash Flood Warning Lead Time and Winter Storm Warning Lead Times. These cyclic replacements occur every three years to ensure that NWS stays abreast of technological changes.

Next Generation Weather Radar

NOAA requests no change to the $8,376,000 base for the Next Generation Weather Radar (NEXRAD). NEXRAD is a Doppler weather radar system that provides automated signal processing, computerized processing of data by sophisticated meteorological software algorithms, and a high-capacity, processor-driven communications capability. The system is modular in design, upgradeable, has a long life-cycle expectancy, and provides both government and commercial sector weather users with a wide array of automated weather information that will increase their capability to meet their respective operational requirements. For the NWS, the system uses Doppler technology and hydrometeorological processing to provide significant increases, both in the functional capability and in performance, compared with previous radars, including improved tornado and thunderstorm warnings, increased air safety, improved flash flood warnings, and improved water resources management.

NWS Telecommunication Gateway

NOAA requests no change to the $495,000 for the NWS Telecommunications Gateway (NWSTG) Legacy Replacement. The NWSTG is the NWS communications hub for collecting and distributing weather information to its field units and external users. Replacing the NWSTG system with up-to-date technology will reduce the current delays in collecting and disseminating data by reducing transit time through the NWSTG. The replacement will ensure reliable delivery of NWS products to users and will fully capitalize on better observation data and prediction models to improve services. In FY 2006, NWS will conclude a three-year effort to replace the National Weather Service Telecommunications Gateway (NWSTG) switching system and repair and upgrade NWSTG facilities. In FY 2007, NWS will execute limited technical refresh in the second quarter, and implement

NWS Back-up Telecommunications Gateway (BTG) infrastructure.

Radiosonde Network Replacement

NOAA requests a planned decrease of $333,000 and 0 FTE for a FY 2007 total of $4,014,000 for the Radiosonde Replacement Program. This decrease reflects extending the deployment schedule by one year so that the network is complete in FY 2009.

CONSTRUCTION

NOAA requests an increase of $11,000,000 and 0 FTE for a total of $19,305,000 to prepare the NOAA Center for Weather and Climate Prediction (NCWCP) for FY 2008 occupancy and operations. This FY 2007 increase is consistent with the planned NCWCP investment profile to implement mission critical systems overlap during the transition/move from the current World Weather Building (WWB) to the NCWCP. NOAA must be ready to install systems and equipment during the six-month period prior to the delivery of space, and in the months immediately preceding the phased completion of construction. Lastly, the funding will be used for project management tasks supporting technical oversight of the construction, occupancy, and mission critical systems relocation processes. Also, detailed planning and closely coordinated relocation activities are an absolute requirement to ensure that critical data products are not interrupted during the relocation of 24x7 mission critical systems. This project is a key component of the NWS' effort to improve its weather and climate modeling performance, to accelerate the transfer of newly developed scientific information into operations, and to improve the use of global environmental satellite data. NWS has demonstrated a direct linkage between establishing new facilities in the proximity of research organizations, and improved program performance. The expiration of the WWB lease dictates the timing of the NCWCP Project and affords an outstanding opportunity to enhance the NWS efforts to protect the continuity and flow of critical weather warning, forecasts and data products to the Public. The award of the lease by GSA in September 2005, will ensure occupancy of the new facility in October 2008. FY 2005 funding provided project management for NOAA, and allowed NOAA to initiate the planning and engineering required to support the mission systems relocation. In FY 2007, construction of the NCWCP will be completed. Simultaneously, NOAA will implement procurements to complete all tenant improvements and outfitting such as, but not limited to: telecommunications cabling (systems acquisition and installation); interior design, system furniture acquisition and installation; and relocation costs. The FY 2007 effort will also involve the one-time relocation of mission critical operational systems from the WWB to the NCWCP. This critical system relocation funding will ensure that NOAA will be able to operate its "mission critical" programs by providing an overlap in system functionality during the physical relocation from the WWB to the NCWCP. Funding for project management includes a project manager, space planner, a project engineer and technical support, to provide continued coordination and oversight among all involved parties including GSA, users, contractors, and consultants.

• NOAA requests a planned decrease of $1,000,000 and 0 FTE for a total of $12,504,000 to reflect the transfer of $1,000,000 of Weather Forecast Office (WFO) construction funding to NOAA facilities to support NOAA facility planning requirements. Planned relocation (construction) of the Office of Atmospheric Research (OAR) housing currently collected at the WSO Bairow, will be deferred to FY 2008. This is a one time deferral. Construction elements currently ongoing include the upgrade and modernization of Alaska and Pacific Region Weather Service Offices, Tsunami Warning Centers, and associated employee housing units; upgrades of Heating, Ventilation, and Air Conduction (HVAC) systems at approximately 60 WFOs, uninterrupted power supply (UPS) replacements, and mitigations of all building and fire code violations. This construction effort is essential to bring the NWS into full compliance with federal law and national and local building codes.

ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICES

Proposed funding for FY 2007 includes a decrease in the Polar-Orbiting Satellite Program (POES) of $(11. 8) million, a net increase in the Geostationary Satellite Program (GOES) of $112.4 million, and an increase in the National Polar-Orbiting Operational Environmental Satellite Systems (NPOESS) of $20.2 million. These changes allow for continuation of procurements to provide the spacecraft and instruments, launch services, and ground systems necessary to assure continuity of environmental satellite coverage. The budget request will maintain a system of polar-orbiting satellites that obtains global data and a system of geostationary satellites that provides near-continuous observations of the Earth's western hemisphere.

Funding for the POES program is decreasing as it approaches the end of its production cycle with one remaining satellite, NOAA N prime, to be launched. The GOES request includes a decrease of $8.8 million for the GOES-N series of satellites, and an increase of $113.4 million for the next generation GOES-R series. The FY 2007 GOES-R funding will begin engineering for several key instruments and continue the imager production begun in FY 2005. Another $20.2 million in funding is included for

NOAA's share of the NPOESS program - the converged NOAA and Department of Defense (DOD) polar-orbiting system that will replace the current NOAA series and the DOD Defense Meteorological Satellite Program (DMSP).

A total of $97.7 million is included in the budget request to maintain basic mission satellite services including maintenance and operation of satellite ground facilities; provision of satellite-derived products, including hazards support; and conduct of research to improve the use of satellite data..

Included in the above request is $3.8 million to continue the Ocean Remote Sensing Program, which began in FY 1995. During the next several years, NOAA will acquire data from foreign and other non-NOAA satellites that will provide measurement of ocean currents, surface winds and waves, subsurface temperature and salinity profiles, ice thickness and flows, and other marine factors.

Included in the budget request is $51.9M for the NOAA Data Centers and Information Services subactivity base operating funds.

NOAA OCEAN SERVICE (NOS).

NOS operational oceanographic observing systems are designed to measure both oceanographic and meteorological parameters in order to meet user and partner requirements. As a result, users of the data and information support a broad cross-cut of the marine transportation sector, the climate change research sector, weather and water programs, and ecosystems research community.

Funding provided through the FY 2007 budget will allow the continuation of the second generation of the NOS CO-OPS advanced data quality control program, the Continuous Operational Real-time Monitoring System (CORMS AI), as well as the continued implementation of the Ocean Systems Test and Evaluation Program (OSTEP), which is a development program for bringing new sensor technology into operations. The FY 2006 budget has allowed for sufficient support to operate the National Water Level Observation Network (NWLON) and for continued growth of the Physical Oceanographic Real-Time System (PORTS). Both the NWLON and PORTS programs have subsets of operational water level stations with meteorological sensors installed for various partners and users, including the NWS.

Under the NOAA-Wide Coastal Storms Program (CSP), targeted stations of existing federal and state tide station networks have been funded to be enhanced with new meteorological sensors. Under a NOAA Ocean Service Partnership Proposal, first funded in FY 2002, a subset of the NWLON in the Great Lakes was enhanced with new meteorological sensors and with continuous GPS. Previously, special, water level stations were enhanced with meteorological sensors in the Gulf of Mexico with funding from the NWS Southern Region. In FY 2005, NOS is using some of the IOOS funding to upgrade and enhance the NWLON and continues to work cooperatively with the NWS National Data Buoy Center to establish common collection and quality control procedures and data streams for meteorological and water level data from NOS and NDBC observing systems. Hurricane Katrina supplemental funds are being used to harden existing NWLON stations to withstand storm surge and to equip more stations with meteorological sensors. NOS operational nowcast/forecast modeling activities are expanding and rely upon NWS Eta model data streams as hydrodynamic model drivers. NOS, in cooperation with NWS and OAR in have developed an operational nowcast/forecast capability for the Great Lakes.

OFFICE OF ATMOSPHERIC RESEARCH (OAR).

Requested funding for FY 2007 for Weather and Air Quality Research (W&AQR) is $41.2 million--a decrease of $26.6 million or more than 39 percent from the FY 2006 appropriation. Increases consist of upward base adjustments of $1.5 million to partially cover inflationary cost increases plus a critical $2.4 million program increase for Regional Air Quality Assessments and rent increases stemming from the move to the new National Weather Center facility in Norman, OK. Proposed decreases include $4.3 million from the Weather & Air Quality Research Laboratories and Cooperative Institutes line item ($1.3 million of one-time hurricane supplemental funding and $3.0 million as the W&AQR share of the new NOAA Joint Institute for the Northern Gulf of Mexico) as well as $1.0 million from Weather & Air Quality Research Programs (Phased-Array Radar or PAR). The latter decrease actually leaves PAR funding at a level of $3.0 million or $2.0 million higher than the President requested in FY 2006. In addition, terminations totaling $25.3 million are proposed for: Atmospheric Investigation Regional Modeling Analysis and Prediction (AIRMAP) ($4.9 million); New England Air Quality Study ($3.0 million); Targeted Wind Sensing ($2.0 million); Risk Reduction in Water Forecasts at Mississippi State University ($2.0 million), New England Center for the Study of Atmospheric Sciences & Policy ($1.5 million); the "STORM" Program at the University of Northern Iowa ($0.6 million); Remote Sensing Research at the Idaho State University/Boise Center Aerospace Laboratory ($0.5 million); East Tennessee Ozone Study ($0.3 million); Central California Air Quality Study ($0.4 million), Urbanet ($5.9 million), Great Plains Center of Atmosphere and Human Health ($1.0 million), High-

Altitude Air Study ($0.3 million), Reducing Wind-Induced Damages from Storms ($1.0 million), and Coordinate NASA-NOAA Severe Storm R&D ($2.0 million).

NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM (NPOESS).

The FY 2007 DOC/DOD budget request for NPOESS is $662.6 million. FY 2007 funds will be used for the continued development of system architecture, technology development efforts, and critical sensor and algorithm development. NPOESS is planned to be launched in FY 2013. This system will exploit advanced hardware and software technologies to produce a more reliable, longer-lived spacecraft with greater mission capability. In addition to new products, NPOESS will also provide a significant reduction (90 minutes to 30 minutes) in the time required to move from sensed to processed data.

NOAA MARINE AND AVIATION OPERATIONS (NMAO).

NMAO supports meteorological activities by collection of related data from ships and aircraft. The FY 2007 President's Budget does not include any significant increases or decreases from the FY 2006 appropriation for NMAO that are related to meteorological data collection.

DEPARTMENT OF DEFENSE (DOD)

The DOD total budget request for FY 2007, excluding NPOESS funding, is $603.4 million which represents a funding increase of 2.1 percent from FY 2006. Specific highlights for each of the military departments are described below:

U.S. AIR FORCE

United States Air Force (USAF) resources for meteorological support fall into several categories: general operations, investment and research, Defense Meteorological Satellite Program (DMSP), and National Polar-orbiting Operational Environmental Satellite System (NPOESS) supporting research. The total Air Force operations and investment funding for FY 2007, including DMSP and NPOESS, is $805 million.

General Operations

The operations portion of Air Force Weather's FY 2007 budget is $317.1 million and funds day-to-day environmental support to the DOD, including the active and reserve components of the Air Force and Army, nine unified commands, and other agencies as directed by the Chief of Staff of the Air Force. Just over 4,400 Active and Reserve Component military and civilian personnel conduct these activities at more than 290 locations worldwide. Approximately 85 percent of personnel specialize in weather; the remainder includes communications, computer, administrative, and logistics specialists.

General Supporting Research

Air Force Weather's FY 2007 budget request for supporting research is $34.9 million. The increase in funding over FY 2006 is a result of research and development efforts related to NPOESS and other transformational initiatives that recapitalize legacy systems, build robust environmental digital data bases and disseminate data streams to DOD and coalition C2 systems in a Machine-to-Machine (M2M)/net-centric era. As part of AF Smart Operations 21st Century (AFSO 21), Air Force Weather is investing in modernized environmental prediction technologies and global information grid technologies that enhance automation and save manpower. Air Force Weather continues their extensive initiative to buildup the strategic center's information technology infrastructure for the expected 10-fold increase in satellite data. Also, Air Force Weather is investing in the following innovative software/systems development efforts in FY 2007 and beyond: Joint Environmental Toolkit (JET), Weather Data Analysis (WDA) and Ensemble Prediction System (EPS). The goals of JET, WDA and EPA are to simplify, standardize, minimize, and automate weather operations at the operational and tactical levels. Specifically, JET will eliminate redundancies/inefficiencies and ultimately extend, consolidate and/or replace the Operational Weather Squadron (OWS) Production System-Phase II (OPS II), the Joint Weather Impacts System (JWIS), the New-Tactical Forecast System (N-TFS), and the weather effects decision aids portion of the Integrated Meteorological System (IMETS). WDA will provide many of the behind the scene tools at the weather production centers necessary for enabling JET to provide decision quality products and information to warfighters. EPS will provide the foundation to fundamentally change legacy forecast processes to an AFSO 21 compatible process necessary for the rapidly changing, net-centric, machine-to-machine future environment. While JET, WDA and EPS work synergistically to provide warfighters a quantum leap in capability, JET is the most visible piece to decision-makers. JET will exploit data contained in the Virtual Joint Meteorological Oceanographic (METOC) Database (VJMDB) via common-user-communications, integrate with joint and coalition command and control and mission planning systems, and provide the machine-to-machine data exchange for assimilating METOC and C4ISR data to meet operational and tactical mission planning and execution requirements. The JET contract was awarded to Raytheon on 28 Mar 20, after a 20-month source selection process.

DMSP

DMSP operations are a critical

source of space-borne meteorological data for the military services and other high-priority DOD programs. DMSP environmental data is also distributed to the National Weather Service (NWS), National Environmental Satellite, Data, and Information Service (NESDIS), the Navy's Fleet Numerical Meteorology and Oceanography Center (FNMOC), the Naval Oceanographic Office (NAVOCEANO), and Air Force Weather Agency (AFWA) according to interagency agreements.

The Air Force's total projected FY 2007 outlays for DMSP are $104.8 million. This funding provides for the operations and sustainment of the on-orbit constellation, as well as integration, test, and flight hardware modifications and replacement to maximize performance and longevity of the satellites that remain to be launched. DMSP satellites are acquired and launched by the Air Force and funding to operate the satellites on-orbit is transferred by the Air Force to NOAA each year.

NPOESS Supporting Research

The FY 2007 DOD R&D budget for NPOESS is $349.3 million for the continued development of system architecture, technology, critical sensors, and algorithms. These dollars are applied to both the NPOESS Preparatory Project (NPP) run by NASA and the NPOESS program being which is being acquired by a tn-agency Integrated Program Office. The NPOESS program is currently in a Nunn-McCurdy breach and is going through a certification process being led by OSD/AT&L. A decision on a restructured NPOESS program will be provided to Congress.

U.S. NAVY

The U.S. Navy FY 2007 budget request for meteorological programs is $90.4 million. The request includes $47.8 million for operational programs and $42.6 million for supporting research.

The Naval Oceanography Program (NOP) remains a unique, world-class program. Focusing support in the environmentally complex coastal/littoral regions around the globe, Naval Meteorology and Oceanography (METOC) personnel (Navy and Marine Corps) are required to provide intelligence preparation of the environment (IPE) for operational decision-makers by assessing the impact of atmospheric and ocean phenomena on platforms, sensors and weapon systems. Additionally, Navy and Marine Corps METOC personnel provide for safe flight and navigation in support of naval, joint, and combined forces operating throughout the world's oceans. This is done with a cadre of highly trained military and civilian personnel, educated in both the sciences and warfighting applications. By teaming with, and leveraging the efforts of other agencies and activities, the NOP meets these challenges in a most cost-effective manner, providing a full spectrum of products and services with only a small percentage of the Federal weather budget.

The Naval Oceanography Program is required to provide comprehensive and integrated weather and ocean support worldwide. The Oceanographer/Navigator of the Navy sponsors programs in four closely related disciplines - meteorology, oceanography, geospatial information services, and precise time and astrometry. All are used to protect ships, aircraft, fighting forces, and shore establishments from adverse ocean and weather conditions, and to provide a decisive tactical or strategic edge by exploiting the physical environment to optimize the performance and efficiency of platforms, sensors, and weapons.

Owing to the crucial interrelationship of the ocean and the atmosphere, Naval METOC requires various oceanographic products to provide the requisite meteorological services. In addition to aviation and maritime METOC support, Navy and Marine Corps METOC teams provide a variety of unique services on demand, such as electro-optical, electro-magnetic and acoustic propagation models and products, METOC-sensitive tactical decision aids, and global sea ice analyses and forecasts.

Support to naval operations is provided under the direction of the Commander, Naval Meteorology and Oceanography Command (CNMOC) located at the Stennis Space Center, Mississippi and the Marine Corps advocate for METOC, the Deputy Commandant for Aviation, at Headquarters Marine Corps, Washington, DC. Naval METOC support starts with sensing the battlespace physical environment and culminates with weapons arriving on target and enabling personnel to operate in the battlespace without being adversely affected by physical environmental phenomena. Operational support for the Navy and Marine Corps includes the day-to-day provision of meteorological and oceanographic (METOC) products and services. As naval operations in the littoral increase, Naval METOC support is directed towards providing on-scene capabilities to personnel that directly furnish environmental data for sensor, weapon system, and personnel planning and employment. These on-scene capabilities are key elements for enabling the warfighters to take advantage of the natural environment as part of battlespace management.

Naval METOC systems acquisition is accomplished through the Program Executive Office for Command, Control, Communications, Computers and Intelligence and Space (C41 and Space) in San Diego, California.

Naval METOC Research and Development (R&D) are cooperatively sponsored by the Oceanographer/Navigator of the Navy and the Chief of Naval Research. Naval R&D efforts typically have applications to meteorologi-

cal, oceanographic, and/or tactical systems. Navy's tabulation of budget data includes R&D funding for basic research, applied research, demonstration and validation, and engineering and manufacturing development.

Projects initiated by the Navy and Marine Corps, under sponsorship of the Oceanographer/Navigator of the Navy, transition from engineering development to operational naval systems. Such efforts include advances in Naval METOC forecasting capabilities, enhancements to communications and data compression techniques, further development and improvement of models to better predict METOC parameters in littoral regions, and an improved understanding of the impact these parameters have on sensors, weapon systems, and platform performance.

As the Department of the Navy continues a transformation begun under *SEAPOWER 21*, increased emphasis will be placed on making the Navy combat-ready, forward-deployed, rotational, and surge-capable to contribute to combined and joint operations in an era of shifting global threats and challenges. The CNMOC Organization is also currently transforming for efficiency and effectiveness to meet these future requirements. The Naval METOC Community continues to work closely with research developers and operational forces to ensure that naval and joint force commanders will always have the most accurate, timely, and geo-referenced METOC information available for successful operations.

U.S. ARMY

The U.S. Army estimates a requirement for $45.3 million for operational support and $10.9 million in research and development in FY 2007. The total amount of money budgeted for weather support is estimated because the costs to support U.S. Air Force (USAF) Battlefield Weather forces are normally part of the overall G-3 or G-2 operating budget at the Army Commands (ACOMs), Army Service Component Commands (ASCCs), Corps, Division, or Brigade level and are not assigned their own program element or budget line. Additionally, programs or projects that are assigned a budget line are often part of a larger project's budget (e.g., IMETS as part of DCGS-A) and the exact amount of monies spent on meteorological related activities cannot be verified. The budget numbers presented in this report represent the best estimate of the Army on meteorological related spending over the period of the report. Operational support is projected to decrease approximately $5.9 million over FY 2006 expenditures and research is estimated to decrease about $2.4 million from the previous year. Staffing will increase slightly. Decreases in funding for meteorological related activities were fairly evenly spread across all activities for FY 2007. Increases in staffing are a result of a projected increase in ARTYMET units within FORSCOM.

Army monies for meteorology are spent in four main areas: support to U.S. Army Artillery Met Sections (ARTYMET), support to USAF Battlefield Weather forces at Army locations, research and development related to the Army mission, and the development, production, and maintenance of Army meteorological systems.

ASCCs with Staff Weather Officers and their associated Battlefield Weather forces provide the same support and services to Air Force Weather (AFW) personnel that they normally provide to Army personnel. This support includes the use of facilities to house weather operations, medical support, access to training facilities, office supplies, utilities and maintenance for weather facilities, vehicles and tactical equipment, and funding for official travel. Eighth U.S. Army, U.S. Army Europe, U.S. Army Pacific, Forces Command, and Training and Doctrine Command all provide this support to AFW personnel assigned at the ACOM level and below. The departure of the First Infantry Division from United States Army Europe significantly reduced the amount of weather support required in USAREUR and resulted in a projected fifty percent decrease in weather related expenditures within that ASCC for FY 2007. USARPAC weather expenditures increased for FY 2007 due to projected increases in maintenance and operating budgets.

Major portions of MACOM meteorological budgets go to support Artillery Meteorology Sections, also known as ARTYMET Teams, or Met Sections. Wind data are then passed to the U.S. Army Artillery units for firing computations. Artillery Met Sections range in size from six personnel at a Light Division, to twelve personnel at a Heavy Division. Eighth U. S. Army, U.S. Army Europe, U.S. Army Pacific, Forces Command, and the Army National Guard all support Met Sections. Training and Doctrine Command supports twenty-four military and civilian personnel at the U.S. Army Artillery School at Fort Sill, Oklahoma. These personnel train ARTYMET Teams on the use of the AN/TMQ-41 Meteorological Measuring Set. ARTYMET team structures will be changing over the next few years to support the Army's new modularity concept. FORSCOM is already making these changes to its artillery sections, and other MACOMS will follow as their forces transform to the new units of action. No attempt has been made to convert the part time Army National Guard ARTYMET Teams into full time equivalents.

Space and Missile Defense Command (SMDC) supports several meteorological missions. SMDC has funding designated for the operational support at the High Energy Laser Systems

Test Facility (HELSTF) for contract services to operate and maintain the instrumentation, equipment, and facilities to support the atmospheric sciences/meteorological mission. SMDC also operates contract support services to operate the Ronald Reagan Missile Defense Test Site for operations support and special weather programs.

Headquarters, Department of the Army, Deputy Chief of Staff, G-2 employs two full-time meteorologists for:

- Development of meteorological policy;
- Coordination of meteorological support within the Department of the Army and with other Department of Defense and Federal agencies and organizations;
- Development of Department of the Army Policy concerning weather; environmental services, and oceanographic support to the Army (less those environmental services functions assigned to the Corps of Engineers); and
- Development of Department of the Army policy concerning peacetime weather support.

This office also sponsors a company grade Army liaison officer at the Air Force Weather Agency (AFWA) in Omaha, Nebraska, to serve in a consulting role to AFWA. The AFWA position is currently vacant. The Air Force provides one full time Staff Weather Officer to serve as a liaison between AFW and the Army Staff.

Forces Command (FORSCOM) will program approximately $13.9 million in FY 2007 for meteorological operations support. Of the $13.9 million budgeted, $13.6 million will be used in support of FORSCOM ARTYMET operations and $0.3 million will be spent for supplies, travel and other contracts for Air Force weather teams supporting FORSCOM units. This includes the addition of a new weather unit at Fort Riley to support the 1st Infantry Division.

Training and Doctrine Command (TRADOC) has programmed approximately $4.2M for FY 2006 for meteorological services. The majority of these TRADOC funds, a total of $4.OM, were programmed for operations support related to training development, instructor/support personnel, logistics (expendable supplies), and repair costs on artillery meteorological systems at the US Army Field Artillery School (USAFAS). Training development costs ($l.74M) in FY 2006 are a result of initiatives to develop interactive multi-media instructional products and cost associated with rewrite of the artillery meteorology field manual. In FY 2007, these costs are projected to decrease to $1 .06M as new instructional material and the field manual are delivered. Instructor/Support personnel costs ($1 .85M) in FY 2006 are the result of USAFAS at Fort Sill, OK employing 28 personnel to conduct training using the AN/TMQ-41 Meteorological Measuring Set (MMS) and the AN/TMQ-52 Meteorological Measuring Set-Profiler (MMS-P). Personnel funding is expected to decrease by approximately $142K in FY 2007 due to the elimination of two contracted instructor positions. Logistics/supply costs ($141K) in FY 2006 funds supplies for meteorological sounding equipment to support live fire and training at Fort Sill. These costs increased significantly from FY 2005 expenditures ($99K) as a result of implementing the new Modular Force design for Army Artillery Meteorology. Under the modular design, the number of Army Artillery Meteorology Sections increases from 82 individual sections to 122 individual sections. In FY 2007 supply costs are expected to be approximately $151K. Repair costs ($260K) in FY 2006 on artillery meteorological systems are expected to decrease by approximately $30K in FY 2007 due to a reduction in the number of MMS-Profiler Systems that will be available for training at USAFAS.

TRADOC also programmed $66K in FY 2006 to fund a TRADOC Systems Manager (TSM) position for the Army's Integrated Meteorological System (IMETS). This position falls under the TRADOC Program Integration Office - All Source Analysis System (TPIO-ASAS) at the US Army Intelligence Center and School (USAICS) at Ft Huachuca, AZ. TPIO-ASAS has programmed $69K for this same position in FY 2007. TRADOC transferred $122K to Air Combat Command for the maintenance and service of five Automated Surface Observing Sensor (ASOS) systems and two pole-mounted Tactical Meteorological Observing Systems (TMOS) at Fort Rucker, AL. Maintenance and service costs have been programmed to increase to $126K in FY 2007.

Army Materiel Command (AMC) will fund a variety of activities for FY 2007, most of which fall into research and development and systems acquisition. AMC will fund developmental and testing costs associated with the Integrated Meteorological System (IMETS). The IMETS budget for FY 2005 underwent an $11.9 million reduction to fund higher priority needs within the Army. However, the Distributed Common Ground System - Army (DCGS-A) and the Department of the Army provided $7.7 million and $6.1 million in FY 2006 and FY 2007, respectively, to maintain the capabilities of this program as it transitions into the DCGS-A. Normal program life cycle issues reduced the Artillery's Profiler budget by $2.6 million in FY 2007. One Profiler system is planned for procurement in FY 2007. Other activities within AMC include Army Research Laboratory, Battlefield Environment Division, which will continue to operate an integrated program of both basic and applied research. The Army Research Office will continue basic research activities with a slight reduction in budget for FY 2007; there was a reduction in expenditures on

weather-related research. It is anticipated that FY 2007 funding for weather-related research efforts at U.S. Army Research Institute of Environmental Medicine (USARIEM) will be level relative to the FY 2006 Level.

DEPARTMENT OF HOMELAND SECURITY (DHS)

On March 1, 2004, the Department of Homeland Security (DHS) assumed primary responsibility for ensuring that emergency response professionals are prepared for any situation in the event of a terrorist attack, natural disaster, or other large-scale emergency. This entails providing a coordinated, comprehensive Federal response to any large-scale crisis and mounting a swift and effective recovery effort. DHS will also prioritize the important issue of citizen preparedness, and educating America's families on how best to prepare their homes for a disaster and tips for citizens on how to respond in a crisis will be given special attention at DHS.

U.S. COAST GUARD (USCG).

All of USCG's funding for meteorological programs is for operations support. For FY 2007, the requested funding level is $20.1 million. (The Coast Guard does not have a specific program and budget for meteorology--all meteorological activities are accomplished as part of general operations.)

The Coast Guard's activities include the collection and dissemination of meteorological and iceberg warning information for the benefit of the marine community. The Coast Guard also collects coastal and marine observations from its shore stations and cutters, and transmits these observations daily to the Navy's Fleet Numerical Meteorology and Oceanography Center and NOAA's National Weather Service. These observations are used by both the Navy and NOAA in generating weather forecasts.

The Coast Guard also disseminates a variety of weather forecast products and warnings to the marine community via radio transmissions. Coast Guard shore stations often serve as sites for NWS automated coastal weather stations, and the National Data Buoy Center provides logistics support in deploying and maintaining NOAA offshore weather buoys.

The International Ice Patrol conducts iceberg surveillance operations and provides warnings to mariners on the presence of icebergs in the North Atlantic shipping lanes. Coast Guard efforts in meteorological operations and services have not changed significantly during recent years.

DEPARTMENT OF THE INTERIOR (DOI)

The total DOI/BLM weather funding request for FY 2007 is $2.4 million. This amount is for meteorological operations and the support of the Bureau of Land Management (BLM) Remote Automatic Weather Station (RAWS) program. An additional $1.1 million is recovered each year through reimbursable accounts with participating agencies. Normal operations and maintenance of the RAWS program is approximately $900,000 yearly. (This includes travel, transportation, utilities, services, supplies, equipment and other non-labor costs.)

Support of the RAWS program by the BLM will continue in FY 2007, as part of the Wildland Fire Agencies' participation in Fire Weather activities and the National Fire Danger Rating System (NFDRS). In addition to upgrading and maintaining fixed-site RAWS, the BLM will address increasing demand for the use of mobile units for both fire and non-fire applications. Continued efforts will be made to achieve an optimum balance of fixed and mobile RAWS resources and support. Cooperation between DOI agencies and the USDA Forest Service regarding combined meteorological requirements for the National Wildland Fire support functions is ongoing. Interagency RAWS activity is coordinated at a working group level with representation by all participants, and will continue to implement NFDRS standards to ensure the protection of both life and property from wildland fires.

DEPARTMENT OF TRANSPORTATION (DOT)

The DOT total budget request for FY 2007 is $546.4 million which represents a funding increase of 7.3 percent from FY 2006. The meteorological programs for the Federal Aviation Administration and the Federal Highway Administration, for FY 2007, are described below.

FEDERAL AVIATION ADMINISTRATION (FAA).

For 2007, FAA has requested a total $541.9 million for the Aviation Weather Programs including acquisition of new systems, operations and support, and supporting research. The actual funding for aviation weather in FY 2006 was $504.5 million. The $39.8 million increase in FY 2007 constitutes a 7.4 percent increase in total funding. The changes are comprised of a) increases in acquisitions of $2.0 million to $93 million, as new systems are required to enhance support of field operations and the aviation industry; b)increases in operations and support of $33 million to $419 million, reflecting salary increases throughout the agency, in associated logistics, and changes in the automated flight service station operations as a result of the A-76 contract award; and c)an increase for aviation weather research of $2.1 million to a total of $23.6 million.

The funding changes reflect major initiatives in the aviation weather programs to bring much automation to the collection of weather observations from remote sensors, to the dissemination of weather products, graphics and decision making information available for use by the air traffic facilities, pilots, the aviation industry and gen-

eral aviation users.

The AWRP will continue research into understanding the geophysical phenomenon in the atmosphere and around airports that present hazardous conditions for aircraft operations. Among these are in-flight icing, turbulence, visibility, ceiling, convective activity, tornadoes, etc. Additional work will be done to improve models, develop better graphics for decision making information, and the impacts of space weather.

FEDERAL HIGHWAY ADMINISTRATION (FHWA).

The total FHWA request for surface transportation weather programs in FY 2007 is $4.2 million, all of which will be used for supporting research and special programs.

In 1999, the FHWA began documenting road weather data requirements, which have served as the basis for the majority of work and research in this area. This work, some of which is described below, includes addressing the technical aspects of the road transportation system (including environmental data collection, processing and dissemination) as well as the institutional challenges associated with system implementation.

These institutional challenges encompass coordination within state and local Departments of Transportation (DOTs) as well as across the transportation and meteorological communities. With regard to technical areas of interest, data collection efforts have included increased coverage of atmospheric and road condition observations, as well as incorporation of road weather data (e.g., pavement and subsurface observations) into broader meteorological observation networks. Better processing includes the application of higher resolution weather models and the development of road condition prediction models (e.g., heat balance models) that are needed to develop the appropriate road weather information. This road weather information will enable more effective decision making, leading to a safer and more efficient surface transportation system.

A USDOT initiative entitled *Clarus* will develop, demonstrate and support deployment of a nationwide surface transportation weather observing and forecasting system, and ultimately foster nationwide data sharing capabilities. *Clarus* will allow agencies to share quality-checked environmental data, ultimately improving forecasts and value-added weather information products, as well as supporting anytime, anywhere road weather information for all road and transit users and operators.

A multi-year effort has been undertaken by the FHWA in cooperation with six national laboratories to prototype and field test advanced decision support tools for winter maintenance managers. The Maintenance Decision Support System (MDSS) prototype is a decision support tool that integrates relevant road weather forecasts, coded rules of practice for winter maintenance operations, and maintenance resource data to provide managers with customized road treatment recommendations. The first functional MDSS prototype was demonstrated in Iowa in early 2003, and during winter 2003-2004. During winter 2004-2005, the MDSS prototype was successfully deployed in a third demonstration in Colorado, and in early 2006, this product was declared a "market ready technology." The current focus of the MDSS project is to continue to build on current outreach program activities such as sponsoring annual stakeholder meetings, conducting product "Road Shows," facilitating technology transfers to the private sector, providing assistance to public agencies in writing request for proposals, and participating in informational conferences. The project team also plans to conduct a series of cost/benefit analyses to produce "hard" financial data that can be used to support investing in such a system and exploring the potential of expanding the functionality of MDSS beyond winter maintenance to include such activities as summer maintenance and traffic management.

The FHWA recently completed a study on how Traffic Management Centers (TMCs) around the country integrate road weather information into their operations. The FHWA documented the types of road weather information received by TMCs, the means of information delivery, how information needs change as the severity of a weather event increases, and how that information impacts traffic management decisions. The FHWA is also conducting analyses and developing models to quantify the impacts of various weather events on highway traffic, as well as investigating a variety of weather-responsive traffic management strategies such as changing traffic signal timing in response to weather and posting weather-related messages on variable message signs. These efforts will help FHWA advance the state-of-the-practice in weather-responsive traffic management.

The efforts described above, as well as future activities captured in the Road Weather Management Program plan should be examined within the context of two key reports published in early 2004, and described below.

In 2002, the FHWA asked the National Research Council (NRC) Board of Atmospheric Sciences & Climate to examine what needs to be done from the research, development, and technology transfer perspectives to improve the production and delivery of weather-related information for the nation's roadways. In March 2004, the NRC released a report, *Where the Weather Meets the Road: A Research Agenda for Improving Road Weather Services*, that recommended the creation of a focused, national road weather research program led by

FHWA that brings together the transportation and meteorological communities, identifies research priorities, and implements new scientific and technological advances. NRC recommendations included making better use of existing road weather information and technologies to increase capabilities for transportation research, establishing a nationwide real-time road weather observing system, developing observing capabilities to assess the accuracy of road weather forecasts, improving environmental sensor technologies, and developing new means to effectively communicate road weather information to a wide range of users. Most, if not all of these recommendations, have been incorporated into the roadmap that is being used to guide the activities of the Road Weather Management Program.

To strengthen relationships between the meteorological and surface transportation communities, the FHWA Road Weather Management Program and the American Meteorological Society (AMS) co-sponsored a *Policy Forum on Weather and Highways* in November 2003. The objective was to discuss the provision of weather information to improve highway operations, the development of strategies to effectively respond to weather information, and the policy issues related to effective application of weather services to the management of the nation's highway system. The forum brought together nearly 100 representatives from public, private, and academic sectors at federal, state, and local levels. The report resulting from the forum, *Weather and Highways: Report of a Policy Forum*, contained several recommendations including long-term congressional funding to develop a national road weather research, development, and applications program; close coordination of federal and state DOTs to improve the safety and efficiency of highways during adverse weather; and establishing a national road weather data collection, processing, and dissemination system.

Based upon recommendations in the AMS and NRC reports, the FHWA and the National Oceanic and Atmospheric Administration (NOAA) signed a memorandum of understanding (MOU) in July of 2005, that will enable the two agencies to work together to achieve shared goals for a safer and more efficient surface transportation system. By working together, these two agencies can take advantage of each other's investments and expertise, as well as promote improved surface transportation weather training, products, and services. A near-term goal of the new partnership is the introduction of new products, services and training to improve the application of weather information to surface transportation operations.

FEDERAL RAILROAD ADMINISTRATION (FRA).

In 2007, the FRA has requested a total $289 million to support the Nationwide Differential Global Positioning System (NDGPS). FRA plans to transfer this funding to NOAA in support of their NDGPS efforts.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

All of the EPA's funding of meteorological and air quality programs is for supporting research. The anticipated funding level in FY 2007 for directed meteorological research is $9.0 million which is the same funding level as in FY 2006.

Currently, increased attention is being paid to the effects of airborne toxins and fine particulate matter on human health, on the effect of climate change on air quality, and the impact on ecosystems. In addition, to promote excellence in environmental science and engineering, EPA established a national fellowship program and substantially increased its support for investigator-initiated research grants. The funding for grants (with reliance on quality science and peer review) and for graduate fellowships (to support the education and careers of future scientists) will provide for a more balanced, long-term capital investment in improved environmental research and development. The funding for the grants program will remain about the same in FY 2007 as in FY 2006.

This program will fund research in areas including ecological assessment, air quality, environmental fate and treatment of toxins and hazardous wastes, effects of global climate change on air quality, and exploratory research. The portion of these grants that will be awarded for meteorological research during FY 2007 cannot be foreseen, but it is probable that the grant awards will increase the base amount of $9.0 million listed above for directed meteorological research.

In collaboration with NOAA, EPA is continuing its development and evaluation of air quality models for air pollutants on all temporal and spatial scales as mandated by the Clean Air Act as amended in 1990. Research will focus on urban, mesoscale, regional, and multimedia models, which will be used to develop air pollution control strategies, human and ecosystem exposure assessments, and air quality forecasting. There will be increased emphasis placed on meteorological research into regional and urban formation and transport of air contaminants in support of the revisions to the National Ambient Air Quality Standards and homeland security. Increased efficiency of computation and interpretation of results are being made possible by means of supercomputing and scientific visualization techniques.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

For FY 2007, NASA requests a total of

$168.8 million. The majority of this funding ($166.4 million) is for supporting research.

The meteorology supporting research programs lie within the Earth-Sun System Division of NASA's Science Mission Directorate (SMD). Due to recent organizational changes, the task of extracting meteorology related funds in the SMD budget has become a complicated undertaking. The line items in the Earth-Sun System budget that support Earth Science are Earth Systematic Missions, Earth System Science Pathfinder, Earth-Sun System Multi-Mission Operations, Earth-Sun Research, Applied Sciences, Education and Outreach and Earth-Sun Technology. Estimation of the meteorology share of this budget was a two step process. The Earth Science part of the budget was estimated in the first step and the meteorology share was estimated, in the second step, to be one eighth of this sum.

NUCLEAR REGULATORY COMMISSION (NRC)

The NRC planned expenditure of $120,000 in FY 2007, is for meteorological operations to continue technical assistance for the analysis of atmospheric dispersion for routine and postulated accidental releases from nuclear facilities, and the review of proposed sites for possible construction of new nuclear power plants.

The meteorological support program in the NRC is focused primarily on analyzing and utilizing meteorological data in atmospheric transport and dispersion models. These models provide insight on plume pathways in the near- and far-fields for building wake and dispersion characteristics to perform dose calculations on postulated releases to the environment. Meteorological information is used as input to the probabilistic safety assessment, the assessment of the radiological impacts of routine releases from normal operations, the assessment of other (non-radiological) hazards that may impact safe operation of the facility, and the assessment of design or operational changes proposed for the facility.

Additionally, after a hiatus of some 25 years, the nuclear power industry has expressed an interest in seeking site approvals for new nuclear power plants. Three early site permit applications have been received and are currently under review. These reviews will also consider regional climatology and local meteorology. In addition to its internal review activities, the NRC may seek assistance from other Federal agencies to support its safety reviews.

AGENCY FUNDING BY BUDGET CATEGORY

Table 2.2 depicts how the agencies plan to obligate their funds for meteorological operations broken down by "budget category." The two major categories are "Operations Support" and "Systems Acquisition." To a large degree, these categories correspond to non-hardware costs (Operations Support) and hardware costs (Systems Acquisition). For agency convenience in identifying small components that do not fit into these two major categories, a third category is added called "Special Programs." Programs that provide support to several government agencies such as the Air Force's DMSP are listed on a separate line.

In FY 2007, Operational Costs requested are $3.03 billion with a total of $1.80 billion (59.3 percent) for Operations Support, $1.19 billion (39.3 percent) for Systems Acquisition, and $40 million (1.3 percent) for Special Programs.

Table 2.3 describes how the agencies plan to obligate their funds for meteorological supporting research according to budget categories. The agencies' supporting research budgets are subdivided along similar lines--Research and Development (non-hardware), Systems Development (hardware), and Special Programs (for those items that do not easily fit into the two major categories).

For FY 2007, agencies will obligate a total of $414 million in Supporting Research funds in the following manner: $331.6 million (80.2 percent) to research and development and $82.1 million (19.8 percent) to Systems Development.

AGENCY FUNDING BY SERVICE CATEGORY

Table 2.4 summarizes how the agencies plan to obligate operational funds for basic and specialized meteorological services; Table 2.5 is a similar breakout for supporting research funds.

Table 2.4 reveals the distribution of FY 2007 operational funds: basic meteorology services receiving 59.5 percent; aviation 19.7 percent; marine 4.3 percent; agriculture/ forestry 0.7 percent; general military services 15.7 percent; and other specialized services accounting for 0.2 percent. Table 2.5 shows the distribution of supporting research funds among the services with basic meteorology receiving 23.8 percent, aviation 6.1 percent, marine 10.4 percent, agriculture and forestry 7.6 percent, general military 8.7 percent, and the remaining 43.4 percent dedicated to other meteorological services.

The definitions of specialized and basic services are described below:

Basic Services.

Basic services provide products that meet the common needs of all users and include the products needed by the general public in their everyday activities and for the protection of lives and property. "Basic" services include the programs and activities that do not fall under one of the specialized services.

Specialized Meteorological Services.

Aviation Services. Those services and facilities established to meet the requirements of general, commercial, and military aviation.

Marine Services. Those services and facilities established to meet the requirements of the DOC, DOD, and DOT on the high seas, on coastal and inland waters, and for boating activities in coastal and inland waters. The civil programs which are directly related to services solely for marine uses and military programs supporting fleet, amphibious, and sea-borne units (including carrier-based aviation and fleet missile systems) are included.

Agriculture and Forestry Services. Those services and facilities established to meet the requirements of the agricultural industries and Federal, state, and local agencies charged with the protection and maintenance of the nation's forests.

General Military Services. Those services and facilities established to meet the requirements of military user commands and their component elements. Programs and services which are part of basic, aviation, marine, or other specialized services are not included.

Other Specialized Services. Those services and facilities established to meet meteorological requirements that cannot be classified under one of the preceding categories; such as, space operations, urban air pollution, global climate change, and water management.

PERSONNEL ENGAGED IN METEOROLOGICAL OPERATIONS

Table 2.6 depicts agency staff resources in meteorological operations. The total agency staff resources requested for FY 2007 is 13,505. This total represents a decrease of 13.5 percent from FY 2006, with the largest decreases occurring in Navy and FAA personnel.

TABLE 2.2 AGENCY OPERATIONAL COSTS, BY BUDGET CATEGORY

(Thousands of Dollars)

AGENCY	Operations Support		Systems Acquisition		Special Programs		Total			% of FY2007
	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	%CHG	TOTAL
Agriculture	20201	19710	0	0	0	0	20201	19710	-2.4	0.7
Commerce/NOAA(Subtot)	960993	970329	854058	950915	22981	32965	1838032	1954209	6.3	64.5
NWS	746844	783446	79575	66611	21825	31809	848244	881866	4.0	29.1
NESDIS	177737	149579	774483	884304	0	0	952220	1033883	8.6	34.1
OAR	0	0	0	0	0	0	0	0	0	0.0
NOS	24078	24970	0	0	0	0	24078	24970	3.7	0.8
NMAO	12334	12334	0	0	1156	1156	13490	13490	0.0	0.4
Defense(Subtot)	373349	364632	129583	148513	1051	911	503983	514056	2.0	17.0
Air Force	260324	265329	49077	51760	0	0	309401	317089	2.5	10.5
DMSP*	16946	16196	67175	87689	0	0	84121	103885	23.5	3.4
Navy	58567	47036	721	750	0	0	59288	47786	-19.4	1.6
Army	37512	36071	12610	8314	1051	911	51173	45296	-11.5	1.5
Homeland Security (Subtot)	19340	20110	0	0	0	0	19340	20110	4.0	0.7
USCG	19340	20110	0	0	0	0	19340	20110	4.0	0.7
Interior/BLM	2400	2400	0	0	0	0	2400	2400	0.0	0.1
Transportation(Subtot)	386486	419379	91107	93110	5723	6135	483316	518624	7.3	17.1
FAA	386197	419090	91107	93110	5723	6135	483027	518335	7.3	17.1
FRA	289	289	0	0	0	0	289	289	0.0	0.0
FHWA	0	0	0	0	0	0	0	0	0.0	0.0
EPA	0	0	0	0	0	0	0	0	0.0	0.0
NASA	2114	2423	280	40	0	0	2394	2463	2.9	0.1
NRC	120	120	0	0	0	0	120	120	0.0	0.0
TOTAL	1765003	1799103	1075028	1192578	29755	40011	2869786	3031692	5.6	100.0
% of FY TOTAL	61.5%	59.3%	37.5%	39.3%	1.0%	1.3%	100.0%	100.0%		

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

TABLE 2.3 AGENCY SUPPORTING RESEARCH COSTS, BY BUDGET CATEGORY

(Thousands of Dollars)

AGENCY	Research & Development		Systems Development		Special Programs		Total			% of FY2007 TOTAL
	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	%CHG	
Agriculture	39706	31395	0	0	0	0	39706	31395	-20.9	7.6
Commerce/NOAA(Subtot)	118504	85467	4320	4320	0	0	122824	89787	-26.9	21.7
NWS	19107	20180	1950	1950	0	0	21057	22130	5.1	5.3
NESDIS	31753	24771	0	0	0	0	31753	24771	-22.0	6.0
OAR	66488	39360	1870	1870	0	0	68358	41230	-39.7	10.0
NOS	0	0	500	500	0	0	500	500	0.0	0.1
NMAO	1156	1156	0	0	0	0	1156	1156	0.0	0.3
Defense(Subtot)	69630	67575	17590	21794	0	0	87220	89369	2.5	21.6
Air Force	14937	14074	13738	20825	0	0	28675	34899	21.7	8.4
DMSP*	0	0	3852	969	0	0	3852	969	-74.8	0.2
Navy	41427	42581	0	0	0	0	41427	42581	2.8	10.3
Army	13266	10920	0	0	0	0	13266	10920	-17.7	2.6
Homeland Security (Subtot)	0	0	0	0	0	0	0	0	0.0	0.0
USCG	0	0	0	0	0	0	0	0	0.0	0.0
Interior/BLM	0	0	0	0	0	0	0	0	0.0	0.0
Transportation(Subtot)	25706	27800	0	0	0	0	25706	27800	8.1	6.7
FAA	21506	23600	0	0	0	0	21506	23600	9.7	5.7
FRA	0	0	0	0	0	0	0	0	0.0	0.0
FHWA	4200	4200	0	0	0	0	4200	4200	0.0	1.0
EPA	9000	9000	0	0	0	0	9000	9000	0.0	2.2
NASA	108700	110400	54100	56000	0	0	162800	166400	2.2	40.2
NRC	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	371246	331637	76010	82114	0	0	447256	413751	-7.5	100.0
% of FY TOTAL	83.0%	80.2%	17.0%	19.8%	0.0%	0.0%	100.0%	100.0%		

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

TABLE 2.4 AGENCY OPERATIONAL COSTS, BY SERVICE

(Thousands of Dollars)

	Basic Meteorology		Aviation		Marine		Agriculture & Forestry		General Military		Other		Total	
AGENCY	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007
Agriculture	0	0	0	0	0	0	20201	19710	0	0	0	0	20201	19710
Commerce/NOAA(Subtot)	1683335	1794508	63700	63700	90997	96001	0	0	0	0	0	0	1838032	1954209
NWS	717625	747135	63700	63700	66919	71031	0	0	0	0	0	0	848244	881866
NESDIS	952220	1033883	0	0	0	0	0	0	0	0	0	0	952220	1033883
OAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NOS	0	0	0	0	24078	24970	0	0	0	0	0	0	24078	24970
NMAO	13490	13490	0	0	0	0	0	0	0	0	0	0	13490	13490
Defense(Subtot)	10078	8124	17786	14336	17193	13858	0	0	455960	475349	2966	2389	503983	514056
Air Force	0	0	0	0	0	0	0	0	309401	317089	0	0	309401	317089
DMSP*	0	0	0	0	0	0	0	0	84121	103885	0	0	84121	103885
Navy	10078	8124	17786	14336	17193	13858	0	0	11265	9079	2966	2389	59288	47786
Army	0	0	0	0	0	0	0	0	51173	45296	0	0	51173	45296
Homeland Security (Subtot)	0	0	0	0	19340	20110	0	0	0	0	0	0	19340	20110
USCG	0	0	0	0	19340	20110	0	0	0	0	0	0	19340	20110
Interior/BLM	0	0	0	0	0	0	2400	2400	0	0	0	0	2400	2400
Transportation(Subtot)	0	0	483027	518335	0	0	0	0	0	0	289	289	483316	518624
FAA	0	0	483027	518335	0	0	0	0	0	0	0	0	483027	518335
FRA	0	0	0	0	0	0	0	0	0	0	289	289	289	289
FHWA	0	0	0	0	0	0	0	0	0	0		0	0	0
EPA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NASA	0	0	0	0	0	0	0	0	0	0	2394	2463	2394	2463
NRC	120	120	0	0	0	0	0	0	0	0	0	0	120	120
TOTAL	1693533	1802752	564513	596371	127530	129969	22601	22110	455960	475349	5649	5141	2869786	3031692
% of FY TOTAL	59.0%	59.5%	19.7%	19.7%	4.4%	4.3%	0.8%	0.7%	15.9%	15.7%	0.2%	0.2%	100.0%	100.0%

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

TABLE 2.5 AGENCY SUPPORTING RESEARCH COSTS, BY SERVICE

(Thousands of Dollars)

	Basic Meteorology		Aviation		Marine		Agriculture & Forestry		General Military		Other		Total	
AGENCY	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007	FY2006	FY2007
Agriculture	0	0	0	0	0	0	39706	31395	0	0	0	0	39706	31395
Commerce/NOAA(Subtot)	120699	87662	1625	1625	500	500	0	0	0	0	0	0	122824	89787
NWS	21057	22130	0	0	0	0	0	0	0	0	0	0	21057	22130
NESDIS	31753	24771	0	0	0	0	0	0	0	0	0	0	31753	24771
OAR	66733	39605	1625	1625	0	0	0	0	0	0	0	0	68358	41230
NOS	0	0	0	0	500	500	0	0	0	0	0	0	500	500
NMAO	1156	1156	0	0	0	0	0	0	0	0	0	0	1156	1156
Defense(Subtot)	13266	10920	0	0	41427	42581	0	0	32527	35868	0	0	87220	89369
Air Force	0	0	0	0	0	0	0	0	28675	34899	0	0	28675	34899
DMSP*	0	0	0	0	0	0	0	0	3852	969	0	0	3852	969
Navy	0	0	0	0	41427	42581	0	0	0	0	0	0	41427	42581
Army	13266	10920	0	0	0	0	0	0	0	0	0	0	13266	10920
Homeland Security (Subtot)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USCG	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interior/BLM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation(Subtot)	0	0	21506	23600	0	0	0	0	0	0	4200	4200	25706	27800
FAA	0	0	21506	23600	0	0	0	0	0	0	0	0	21506	23600
FRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FHWA	0	0	0	0	0	0	0	0	0	0	4200	4200	4200	4200
EPA	0	0	0	0	0	0	0	0	0	0	9000	9000	9000	9000
NASA	0	0	0	0	0	0	0	0	0	0	162800	166400	162800	166400
NRC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	133965	98582	23131	25225	41927	43081	39706	31395	32527	35868	176000	179600	447256	413751
% of FY TOTAL	30.0%	23.8%	5.2%	6.1%	9.4%	10.4%	8.9%	7.6%	7.3%	8.7%	39.4%	43.4%	100.0%	100.0%

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

TABLE 2.6 PERSONNEL ENGAGED IN METEOROLOGICAL OPERATIONS
(Units are Full Time Equivalent Staff Years)*

AGENCY	FY 2006	FY 2007	% CHANGE	% of FY 2007 TOTAL
Agriculture	271	268	-1.1	2.0
Commerce/NOAA (Subtotal)	5,953	5,963	0.2	44.2
NWS	4,870	4,880	0.2	36.1
NESDIS	890	890	0.0	6.6
OAR	32	32	0.0	0.2
NOS	107	107	0.0	0.8
NMAO	54	54	0.0	0.4
Defense	5665	5516	-2.6	40.8
Air Force (Subtotal)	4,714	4,609	-2.2	34.1
Air Force Weather	4,594	4,490	-2.3	33.2
DMSP	120	119	-0.8	0.9
Navy	617	547	-11.3	4.1
Army	334	360	7.8	2.7
Homeland Security (Subtotal)	108	108	0.0	0.8
USCG	108	108	0.0	0.8
Interior/BLM (Subtotal)	28	28	0.0	0.2
Interior	26	26	0.0	0.2
Reimbursed**	2	2	0.0	0.0
Transportation (Subtotal)	3,695	1,728	-53.2	12.8
FAA	3,550	1,301	-63.4	9.6
FHWA	4	4	0.0	0.0
EPA	0	0	0.0	0.0
NASA	0	0	0.0	0.0
NRC	2	2	0.0	0.0
TOTAL	15,613	13,505	-13.5	100.0*

* Column total does not exactly equal 100 percent due to rounding for several agencies.
** “Reimbursed" are personnel funded by other agencies.

INTERAGENCY FUND TRANSFERS

Table 2.7 summarizes the reimbursement of funds from one agency to another during FY 2006. Agencies routinely enter into reimbursable agreements when they determine that one agency can provide the service more efficiently and effectively than the other. While specific amounts may vary from year-to-year, the pattern shown is essentially stable and reflects a significant level of interagency cooperation.

Department of Commerce. NESDIS will transfer a total of $199.3 million to NASA for procurement and launches of polar-orbiting ($72.2 million) and geostationary ($127.1 million) satellites.

Department of Defense. The Air Force will reimburse DOC a total of $19.765 million for operations [e.g., DMSP operations ($10.807 million), OFCM support ($140,000), Lightning Data ($695,000), NCEP operations ($14,000), WSR-88D support ($6,754,000), COMET training development ($225,000), geomagnetic data ($230,000), and IPO support ($216,000)]. In addition, the Air Force will reimburse NASA $1.414 million for a variety of data and USGS $350,000 for the purchase of magnetometer data support.

The Navy will reimburse DOC $209,000 for basic climatological analysis and forecasting, and interagency coordination.

The Army reimbursements to DOC/NOAA include $597,000 from COE to NWS for maintaining precipitation reporting stations The U.S. Geological Survey will also be reimbursed $500,000 by the Army's COE for operations and maintenance of hydrologic and precipitation reporting stations.

Department of Transportation. The FAA will reimburse NOAA $35.5 million for FY 2007. Included in those funds are development of enhancements and operational support associated with the WSR-88D, ASOS maintenance, the Center Weather Service Units at all Air Route Traffic Control Centers, the World Area Forecast System, meteorology instructors at the FAA, studies and OFCM support. The FAA will also reimburse the DOD a total of $3.4M for supporting research.

The FRA transferred $141,500 to NOAA's Global Systems Division (GSD) of the Earth System Research Laboratory (ESRL) in 2005, to fund the purchase of weather sensing equipment which was installed at the Nationwide Differential Global Positioning System (NDGPS) sites constructed in 2005. In 2006, FRA requested an increase in NDGPS funding to accelerate construction. Thus, FRA plans to transfer approximately $289,000 to GSD in 2006.

National Aeronautics and Space Administration (NASA). The Air Force will be reimbursed a total of $1.655 million--$1.500 million for observations, forecasts, and operations/maintenance of weather infrastructure and replacement of upper air systems at Trans-Atlantic Abort Landing Sites and $165 million for operation and maintenance of weather towers at Edwards AFB, CA. The UCAR will receive $15,000 for data analysis to improve lightning launch commit criteria. The National Data Buoy Center will receive reimbursements of $133,000 for the operation of two data buoys.

Environmental Protection Agency (EPA). NOAA's Air Resources Laboratory (ARL) will receive $6.7 million for development, evaluation, and application of air quality dispersion models; and for provision of meteorological expertise and guidance for EPA policy development activities.

Nuclear Regulatory Commission (NRC). The NRC enjoys a unique relationship with the DOE as a result of the Energy Reorganization Act of 1974. The act realigned the Atomic Energy Commission into a regulatory organization-NRC and a research and promotional organization-ERDA (which was subsequently absorbed into DOE). As a result, the NRC has access to the DOE national laboratories for technical assistance activities. This assistance, while not a reimbursable agreement, results in the transfer of funds from NRC for specific technical assistance by DOE laboratories. In FY 2006, the NRC expects to task DOE laboratories and the National Oceanic and Atmospheric Administration's National Climatic Data Center at a funding level of $120,000.

FACILITIES/LOCATIONS FOR TAKING METEOROLOGICAL OBSERVATIONS

Table 2.8 indicates the number of facilities/locations or platforms at which the Federal agencies carry out (or supervise) the taking of various types of meteorological observations.

TABLE 2.7 INTERAGENCY FUND TRANSFERS FOR METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH

Agency Funds Transferred from:	Agency Funds Transferred to:	FY 2006 Funds ($K) Estimated or Planned Operations	Supporting Research
Commerce/NOAA	NASA (Polar satellite acquisition)	72,274	
	NASA (Geo satellite acquisition)	127,061	
Defense/Air Force			
	NOAA(DMSP Satellite Operations)	10,807	
	DOC/NOAA/NWS (NEXRAD)		200
	DOC/NOAA/NWS (NEXRAD)	6,754	
	DOC/NOAA/NWS (ASOS)		138
	DOC/NOAA/NWS (ASOS)	705	
	DOC/NOAA (Shared Processing Network	105	
	DOC/NOAA/NWS/NCEP(NCEP Communication Circuit Support)	14	
	DOC/NOAA (COMET)		225
	DOC/NOAA/NWS (Lightning Detection System)	695	
	DOC/NOAAOFCM	140	
	DOC/NOAA/NESDIS/IPO (DMSP: Activation of DOMSAT)	216	
	USGS (Dept. of Interior) (USGS Magnetometer)	350	
	NASA (JPL Tech Data)	210	
	DOC/NOAA/SEC (ACE Radian / Data Geomagnetic)	230	
	NSF (Universal Center for Atmos Research)		43
	NSF/UCAR/NCAR (WRF)		3,565
	NSF/UCAR (Data Assimilation)		500
	DOC/NOAA/ESRL (WRF)		50
	NASA (Land Information System)		1,414
Defense/Navy	DOC/NOAA/NCDC	44	
	DOC/NOAA/OFCM	165	
Defense/Army	DOD/USAF/ACC	122	
	DOC/NOAA/ETL		40
	NSF		44
	NSF		53
	DOC/NOAA/NWS	50	
	DOI/USGS	500	
	DOC/NOAA/NWS	597	
	DOC/NOAA/OFCM	65	

TABLE 2.7 INTERAGENCY FUND TRANSFERS FOR METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH (Continued)

Agency Funds Transferred from:	Agency Funds Transferred to:	FY 2006 Funds ($K) Estimated or Planned Operations	Supporting Research
Transportation/FAA	DOC/NOAA	35,500	
	DOD/USAF		3,400
	DOC/NOAA/OFCM	200	
Transportation/FRA	DOC/NOAA	289	
NASA	DOD/USAF/45th SW	1,500	
	DOD/USAF/Edwards AFB	165	
	DOC/NOAA/NDBC	133	
	UCAR		15
EPA	DOC/NOAA/OAR		6,700
NRC	DOE/PNNL	120	

TABLE 2.8 FACILITIES/LOCATIONS FOR TAKING METEOROLOGICAL OBSERVATIONS

TYPE OF OBSERVATION/AGENCY	No. of Locations (FY 2006)
Surface, land	
Commerce (all types)	841
Air Force (U.S. & Overseas)	162
Navy (U.S. & Overseas)	68
Marine Corps (U.S. & Overseas)	13
Army (U.S. & Overseas)	47
Transportation (Flight Service Stn)	8
Transportation (Lim Aviation Wx Rptg Stn)	114
Transportation (Contract Wx Obsg Stn)	189
Transportation (Auto Wx Obsg Stn)	198
Transportation (Road Wx Obsg Stn)	2,149
Transportation (Auto Sfc Obsg Sys, fielded)	569
Homeland Security (USCG Coastal)	50
Interior	470
Agriculture	1595
NASA (all types)	46
Surface, marine	
Commerce (SEAS-equipped ships)	140
Commerce (Coastal-Marine Autom Network)	65
Commerce (NOAA/NOS/PORTS)	6
Commerce (Buoys--moored)	64
Commerce (Buoys--drifting)	21
Commerce (Buoys--large navigation)	10
Commerce (Water-level gauges)	*175
*Number of which have meteorology sensors	59
Navy (Ships with met personnel)	29
Navy (Ships without met personnel	288
Homeland Security (USCG Cutters)	248
NASA (Buoys - moored)	2
Upper air, balloon	
Commerce (U.S.)	86
Commerce (Foreign, Cooperative)	22
Air Force, Fixed (U.S. & Overseas)	12
Air Force, Mobile	15
Army, Fixed (U.S. & Overseas)	18
Army, Mobile (U.S. and Overseas)	85
Navy, Fixed (U.S. & Overseas)	11
Navy, Mobile(U.S. & Overseas)	47
Navy, Ships	29
Marine Corps, Mobile	10
NASA (U.S.)	1
Atmospheric Profilers	
Air Force (Eastern Range)	5
Air Force (Western Range)	6
Army	9
NASA	1
Upper air, rocket	
Army (U.S. & Overseas)	1
Doppler weather radar (WSR-88D) sites	
Commerce (NWS)	123
Air Force (U.S. & Overseas)	26
Army (U.S. & Overseas)	2
Transportation (Off CONUS	12
Doppler weather radar (Not WSR-88D) sites	
Air Force (Fixed)	9
Army	2
Navy (Fixed)	9
Marine Corps (Mobile)	10
Marine Corps 9Fixed)	1
Off-site WSR-88D Processors (PUPs)	
Commerce (NWS) [Part of AWIPS]	0
Air Force (OPUPs only)	97
Marine Corps (U.S. & Overseas)	9
Army	1
Transportation	25
NASA (KSC/AMU)	1
Airport Terminal Doppler weather radars	
Transportation (Commissioned)	45
Army (not airfield--Test Range/USAREUR)	2
Conventional radar (non-Doppler) sites	
Commerce (NWS)	31
Commerce (at FAA sites)	27
Air Force, Mobile Units	23
Army (U.S. and Overseas)	4
Transportation (FAA (WSP))	34
Weather reconnaissance (No. of aircraft)	
Commerce (NAMO)	3
Air Force Reserve Command (AFRC)	10
Geostationary meteorological satellites (No. operating)	
Commerce (2 primary, 2 standby, 1 post launch checkout)	5
Polar meteorological satellites (No. operating)	
Commerce (2 primary, 4 standby)	6
Air Force (2 primary, 3 standby)	5
Navy (WINDSAT AND GFO)	2
Field Mills (Surface)	
NASA (KSC)	31